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Spectrum of premalignant oral lesions in rural North Indian population at a tertiary care hospital

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ABSTRACT

Background: The objective of the study was to study the spectrum of premalignant oral lesions in rural North Indian population at a tertiary care hospital.
Methods: A total of 340 patients with oral lesions for more than 2 weeks were enrolled in the study. Patients with proven malignancy, white patch in the oral cavity which can be scrapped off, e.g. oral candidiasis and urban patients were excluded. Biopsy specimen was obtained from all the patients and evaluated histopathologically. Site, nature and type of oral lesion were determined. Demographic data and exposure to different risk factors was also noted. Findings were correlated using Chi-square test.
Results: Premalignant lesions were seen in 191 (56.18%) cases. They included leukoplakia (n=87; 45.5%), OSMF (n=62; 32.5%), Erythroplakia (n=18; 9.4%), lichen planus (n=15; 7.9%), melanoplakia/ melanosis (n=8; 4.2%) and DLE (n=1; 0.5%) respectively. Most common sites affected by premalignant lesions were buccal mucosa (n=173; 90.6%), retromolar area (n=42; 22%). Majority of patients with premalignant lesions were aged 26-50 years (78.5%), males (62.8%), farmers/labourers (56%) and illiterate/educated upto primary level (57.1%). Almost all the patients had two or more adverse oral habits with areca nut chewing being most common (69.6%) followed by tobacco chewing (66%) and smoking (60.2%) respectively. Majority had these addictions for ≥5 years (66%).
Conclusions: Leukoplakia and OSMF dominated the premalignant lesions in rural patients having low education and high prevalence of adverse oral habits for prolonged duration.

Keywords: Premalignant oral lesions, Leukoplakia, Oral submucous fibrosis, Rural, Adverse oral habits

INTRODUCTION

The oral cancer constitutes about 3% of all malignancies in the US, and approximately 25,000-30,000 patients of oral cancer are diagnosed every year.[1] Also, oral cancer is the most common malignancy in Southeast Asia, accounting for about 30-40% of all malignancies in India.[2] Development of malignant oral lesions is generally through a progression from the oral conditions termed as premalignant. The terms precancer, precursor lesions, premalignant, intra-epithelial neoplasia and potentially malignant have been used in the literature to broadly describe clinical presentation that may have a potential to become cancer. A precancerous lesion is a morphologically altered tissue in which oral cancer is more likely to occur than in its apparently normal counterpart.[3]

Conventional oral examination using normal (incandescent) light is the most commonly applied and accepted screening method for oral squamous cell carcinoma. This easily available and cheap method has

found to be equally effective in detecting premalignant lesions across all levels of training, including junior and senior residents as well as trained healthcare workers or auxiliaries. It is particularly useful for screening accessible sites such as buccal mucosa, tongue, and floor of mouth.[4]

The early detection of cancer is of significant importance as there is marked improvement of survival rates when the oral lesion is identified at an early stage.[5] However, different oral lesions have varying malignancy potential and not all oral lesions are premalignant in nature, hence it is essential to assess the spectrum of oral lesions and to identify the potential premalignant lesions in a rural population attending a tertiary care facility in north India.

METHODS

The present study was carried out as a cross-sectional study in the Department of Otorhinolaryngology, Era's Lucknow Medical College and Hospital, Lucknow over a period starting from January, 2016 to June, 2017 after approval from Institutional Ethics Committee and obtaining consent from all the participants. A total of 340 patients attending the outpatient department of otolaryngology of Era's Lucknow Medical College and Hospital, having complaints suggestive of oral cavity lesions for more than 2 weeks were included in the assessment. Proven cases of oral malignancy and patients with white patch in the oral cavity which can be scrapped off, e.g. oral candidiasis were excluded from the assessment.

Personal and clinical history of the patients was obtained and was recorded on a case record form for each individual, patients were subjected to necessary laboratory and radiographic investigations and biopsy was taken from the lesion and was sent for histopathological examination.

The patient was made comfortable and a detailed history of his complaints was taken on a case record form designed for the same.

The standard procedure of examination of ear, nose, throat, oral cavity, face and neck was carried out on each patient according to the protocol followed in the Outpatient Department of Otolaryngology, Era's Lucknow Medical College, Lucknow.

Patients were explained about the study and written and informed consent was taken for participation in the study.

Xylocaine sensitivity with 2% was done intradermally and tetanus injection was injected intra muscularly before taking the biopsy.

Local was infiltrated around the site of lesion. Punch biopsy was taken from the site of lesion and was sent for histopathological examination**.**

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 21.0. Data was represented as mean±SD. Chi-square test and independent samples 't'-test was used to compare the data. 'p' value less than 0.05 was considered statistically significant.

RESULTS

Premalignant lesions were seen in 191 (56.18%) cases. They included leukoplakia (n=87; 45.5%), OSMF (n=62; 32.5%), erythroplakia (n=18; 9.4%), lichen planus (n=15; 7.9%), melanoplakia/melanosis (n=8; 4.2%) and DLE (n=1; 0.5%) respectively. There were 149 (43.83%) benign/non-premalignant cases. Among these, there were 74 (49.7%) cases of apthous ulcers major, 43 (28.9%) geographical tongue, 3 (2%) mucocele, 4 (2.7%) papilloma and 2 (1.3%) pyogenic granuloma. A total of 23 (15.4%) were traumatic ulcers (Table 1).

Table 1: Distribution of cases according to HPE diagnosis.

Group	HPE Diagnosis	No.	%
Premalignant (N=191; 56.18%)	Actinic keratosis	1	0.5
	Erythroplakia	18	9.4
	Leukoplakia	87	45.5
	Lichen planus	15	7.9
	Melanoplakia/melanosis	8	4.2
	OSMF	62	32.5
Non-premalignant/ benign (N=149; 43.82%)	Apthous ulcers major	74	49.7
	Geographical tongue	43	28.9
	Mucocoele	3	2.0
	Papilloma	4	2.7
	Pyogenic granuloma	2	1.3
	Traumatic ulcer	23	15.4

Most common sites affected by premalignant lesions were buccal mucosa (n=173; 90.6%), retromolar area (n=42; 22%). Among non-premalignant/benign lesions too buccal mucosa was the most commonly affected site (62.4%) followed by tongue (48.3%), hard palate (14.1%), soft palate (11.4%) and lower gingival (0.7%) respectively. Significantly higher proportion of non-premalignant/benign lesions as compared to premalignant lesions had tongue as the affected site. For all the other sites relatively higher proportion of premalignant as compared to non-premalignant/benign lesions (Table 2).

Majority of patients with premalignant lesions were aged 26-50 years (78.5%), males (62.8%), farmers/labourers (56%) and illiterate/educated up to primary level (57.1%). Almost all the patients had two or more adverse oral habits with areca nut chewing being most common (69.6%) followed by tobacco chewing (66%) and smoking (60.2%) respectively. Majority had these addictions for $\geq$5 years (66%). In contrast, non-premalignant/benign lesions were most common in age group 26-50 years (50.3%) followed by 18-25 years (44.3%) and $\geq$51 years (5.4%) respectively. Thus

significantly higher proportion of non-premalignant lesions as compared to premalignant lesions were aged 18-25 years whereas significantly higher proportion of premalignant as compared to non-premalignant/benign cases were aged 26-50 years (p<0.001). Among those with premalignant lesions, 62.8% were males whereas among those having non-premalignant/benign lesions only 45.6% were males. Statistically this difference was significant (p=0.002). Proportion of farmers was significantly lower in non-premalignant/benign group (11.4%) as compared to that in malignant group (27.2%) (p<0.001) while that of students was significantly higher in non-premalignant/benign (7.4%) as compared to premalignant group (1%) (p=0.003). For other occupations, there was no significant difference between two groups (p>0.05). No significant difference between premalignant and non-premalignant/benign group was observed with respect to education (p>0.05) (Table 3).

Habit of areca-nut and tobacco chewing was significantly higher in premalignant group (69.6% and 66%) as compared to that in non-premalignant/benign grup (38.9% and 45.6%) (p<0.001). Habits of combined use of smoking+areca nut/tobacco chewing, areca nut+tobacco and areca nut+ smoking was also significantly higher in premalignant (54.5%, 44.5% and 41.9%) as compared to that in non-premalignant/benign group (24.8%, 16.1% and 12.8%) (p<0.001) (Table 4).

Table 2: Association of site of lesion with type of lesion.

Site	Total	Pre-malignant (N=191)		Benign/ Non-malignant (N=149)		Statistical significance	
		No.	%	No.	%	χ^2/p	OR (95% CI)
Tongue	106	34	17.8	72	48.3	36.339/<0.001	0.23 (0.142-0.378)
Buccal mucosa	267	174	91.1	93	62.4	40.844/<0.001	6.16 (3.388-11.211)
Hard palate	64	43	22.5	21	14.1	3.833/0.049	1.77 (0.999-3.141)
Soft palate	51	34	17.8	17	11.4	2.682/0.101	1.68 (0.899-3.146)
Gingival lower	38	37	19.4	1	0.7	29.486/<0.001	35.56 (4.817-262.49)

Table 3: Demographic profile and type of lesions.

Variables	Total	Pre-malignant (N=191)		Benign/ Non-malignant (N=149)		Statistical significance	
		No.	%	No.	%	χ^2/p	OR (95% CI)
Age (in years)							
18-25	94	28	14.7	66	44.3	36.751/ <0.001	0.22 (0.129-0.362)
26-50	225	150	78.5	75	50.3	29.735/ <0.001	3.61 (2.252-5.785)
≥51	21	13	6.8	8	5.4	0.298/ 0.585	1.29 (0.519-3.192)
Gender							
Female	152	71	37.2	81	54.4	10.005/ 0.002	0.50 (0.321-0.768)
Male	188	120	62.8	68	45.6		2.01 (1.302-3.113)
Occupation							
Farmer	69	52	27.2	17	11.4	12.944/ <0.001	2.90 (1.599-5.278)
Housewife	97	53	27.7	44	29.5	0.130/ 0.718	0.92 (0.571-1.472)
Service	31	16	8.4	15	10.1	0.289/ 0.591	0.82 (0.390-1.711)
Shopkeeper/ Business	25	13	6.8	12	8.1	0.191/ 0.662	0.83 (0.369-1.885)
Skilled labourer	29	13	6.8	16	10.7	1.659/ 0.198	0.61 (0.282-1.305)
Student	13	2	1.0	11	7.4	9.136/ 0.003	0.13 (0.029-0.609)
Unskilled labourer	76	42	22.0	34	22.8	0.033/ 0.855	0.95 (0.571-1.593)
Education							
Illiterate	86	46	24.1	40	26.8	0.338/ 0.561	0.86 (0.529-1.413)
Primary	108	63	33.0	45	30.2	0.299/ 0.584	1.14 (0.717-1.805)
Middle-High school	81	44	23.0	37	24.8	0.149/ 0.700	0.91 (0.549-1.496)
Intermediate	37	22	11.5	15	10.1	0.182/ 0.670	1.16 (0.581-2.329)
Graduate and above	28	16	8.4	12	8.1	0.012/ 0.914	1.04 (0.478-2.280)

Table 4: Exposure to different risk factors and type of lesion.

Risk factors	Total	Pre-malignant (n=191)		Benign/non-malignant (n=149)		Statistical significance	
		No.	%	No.	%	χ^2/p	OR (95% CI)
Smoking	193	115	60.2	78	52.3	2.107/ 0.147	1.38 (0.893-2.123)
Areca nut	191	133	69.6	58	38.9	32.060/ <0.001	3.60 (2.291-5.649)
Tobacco chewing	194	126	66.0	68	45.6	14.121/ <0.001	2.31 (1.487-3.585)
Spicy food	287	161	84.3	126	84.6	0.005/ 0.946	0.98 (0.542-1.769)
Smoking + arecanut/ tobacco	141	104	54.5	37	24.8	30.251/ <0.001	3.62 (2.266-5.779)
Arecanut + tobacco	109	85	44.5	24	16.1	30.985/ <0.001	4.18 (2.479-7.037)
Arecanut + smoking	99	80	41.9	19	12.8	34.421/ <0.001	4.93 (2.815-8.639)
Spicy food + smoking/ arecanut/ tobacco	276	155	81.2	121	81.2	0.000/ 0.990	1.00 (0.576-1.724)

DISCUSSION

In present study, out of 340 cases enrolled in the study, a total of 191 (56.18%) had premalignant conditions while remaining 149 (43.82%) had non-neoplastic/benign inflammatory conditions. Thus prevalence of premalignant conditions was 56.18% in our study. Compared to this, Kumar et al in their study noticed benign/non-neoplastic oral conditions in 32% of their patients.[6] However, in their study, Joshi and Tailor found non-neoplastic/benign oral conditions in 75.1% of their patients screened for tobacco-associated oral lesions.[7] Gupta et al too in their study reported of benign lesions to be 3.3 times higher than the premalignant lesions among patients having neoplastic lesions of oral cavity and oropharynx.[8]

The rate of non-neoplastic/benign conditions in different studies varies sufficiently as per the sampling frame of the study. In fact, the term premalignant, precancerous and/or potentially malignant is inclusive in nature and can include almost all the abnormal oral lesions that may have some potential to become malignant. As per definition a precancerous lesion is a morphologically altered tissue in which oral cancer is more likely to occur than in its apparently normal counterpart and hence can include any morphologically abnormal condition.

In present study, among premalignant conditions, the most common was Leukoplakia (87/191; 45.5%) followed by OSMF (62/191; 32.5%), erythroplakia (18/191; 9.4%), lichen planus (15/191; 7.9%), melanoplakia/ melanosis (8/191; 4.2%) and actinic keratosis (1/191; 0.5%) respectively. Thus, leukoplakia (45.5%) and OSMF (32.5%) were the two most dominant premalignant conditions that comprised 78.0% of total premalignant lesions. Similar to our study, Ambekar et al and Mishra et al, also found leukoplakia to comprise 37.8% and 41.6% of premalignant lesions in their series.[9,10] Jagtap et al in their study found leukoplakia to comprise 68.41% of their study population.[11] As far as OSMF is concerned, a number of studies have reported it to be dominant premalignant type reporting in 30.4% to 88.1% of premalignant lesions.[12-14]

In present study, majority of cases had involvement of multiple sites. In premalignant group, buccal mucosa was most commonly involved (91.1%) followed by hard palate (22.5%), gingival (19.4%), soft palate and tongue (17.8% each). The involvement of buccal mucosa in maximum number of cases could be justified owing to OSMF and leukoplakia as the major premalignant etiologies. In previous studies, description regarding sites is not as descriptive as in ours. Most of the studies have mentioned only one site per case, however, in conditions like leukoplakia multiple sites can be involved, more so in advanced cases, where it can spread from tongue to buccal mucosa, alveolar mucosa and lower lip, floor of mouth and lateral tongue.[15,16] Similarly, buccal mucosa, retromolar area, soft palate, palatal fauces, uvula, tongue and labial mucosa can be seen to be involved in cases of OSMF. However, despite mentioning only one site per case in different case series, the dominance of buccal mucosa and tongue has been reported in other studies too.[17] With respect to difference in site of premalignant and other precancerous cases, it could be primarily attributed to a high proportion of cases of geographic tongue in this group.

The present study showed that premalignant lesions as compared to non-neoplastic/benign lesions were more common in higher age groups, in males as compared to females, among farmers, areca nut chewers, tobacco chewers or those having combination of areca nut and/or

tobacco with other habits and those having longer duration of symptoms. These findings in turn are related with traditional risk factors showing presence of malignant and premalignant lesions in older age groups, males, lower socioeconomic strata and adverse oral habits like tobacco-chewing, gutkha or pan-masala use for prolonged periods.[7,18,19]

The findings of present study presented the spectrum of premalignant and oral lesions from a rural centre in Lucknow, the profile of premalignant lesions in present study showed a slight variability from a other study conducted in mixed rural-urban population in our city, thus showing that profile of premalignant lesions depends on the environment and level of exposure to different risk factors. Cross-sectional community based studies with inclusion of patients with normal oral mucosa are recommended to measure the weight of different risk factors.

CONCLUSION

The present study was conducted to study the prevalence of premalignant lesions in various lesions of oral cavity in rural north Indian population in a tertiary care hospital and to study the etiology and predisposing factors of oral premalignant lesions.

1. Proportion of cases of non-premalignant was significantly higher as compared to pre-malignant having lesions at tongue (47.0% vs. 14.1%). Lesions at Buccal mucosa, retromolar area and soft palate were significantly higher in premalignant as compared to non-premalignant. Difference in site of lesion among different types of pre-malignant cases (Leukoplakia, OSMF and others) was also significant.
2. Proportion of males in premalignant lesions (62.8%) was significantly higher as compared to non-premalignant (45.6%). Leukoplakia and OSMF were more common in males while other pre-malignant oral lesions were more common in females.
3. Use of areca nut, consumption of tobacco, habit of smoking along with arecanut/tobacco, consumption of arecanut with tobacco and habit of smoking with areca nut were observed in significantly higher proportion of cases of pre-malignant as compared to non-premalignant. These addictions were not found to be statistically associated with different types of premalignant lesions.
4. Higher duration of addictions/habits (>10 years) was observed in significantly higher proportion of patients of premalignant as compared to non premalignant.

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